

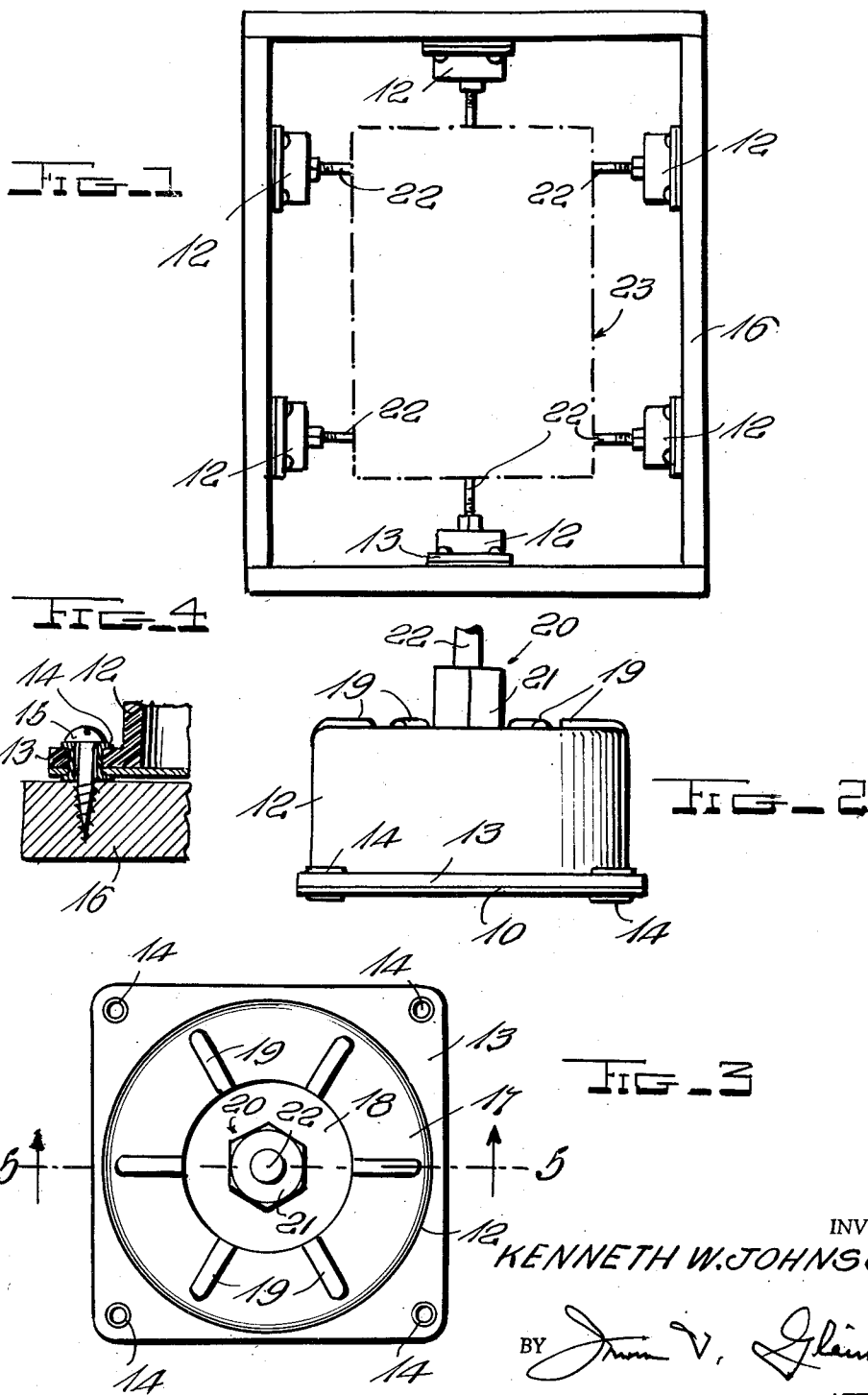
Jan. 22, 1957

K. W. JOHNSON
VIBRATION DAMPENER

2,778,629

Filed Sept. 1, 1954

2 Sheets-Sheet 1



INVENTOR
KENNETH W. JOHNSON,

BY *John V. Glavin*
ATTORNEY

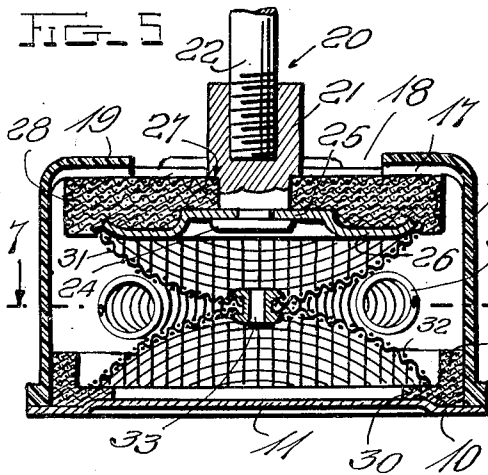
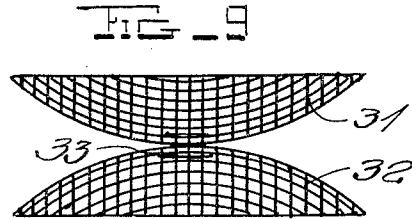
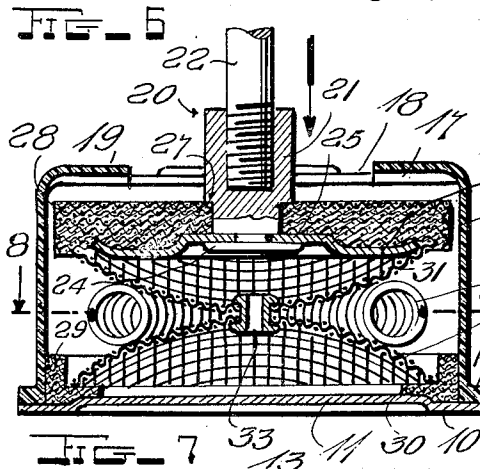
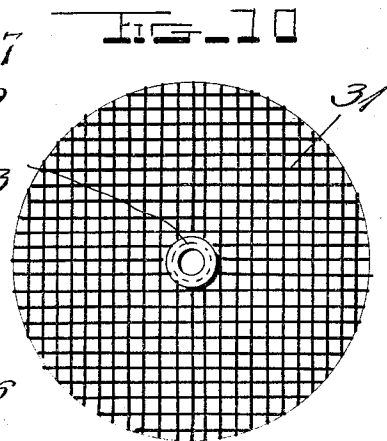
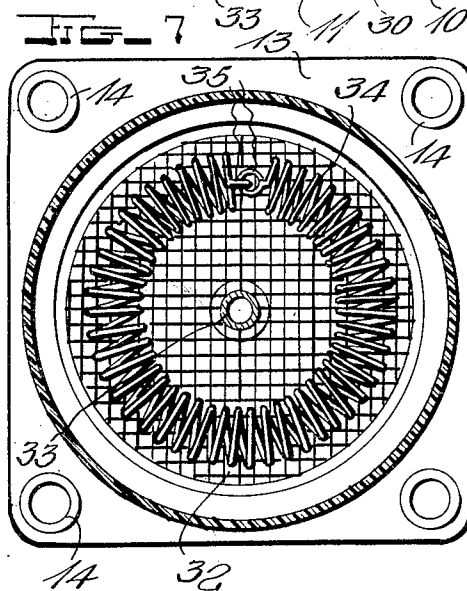
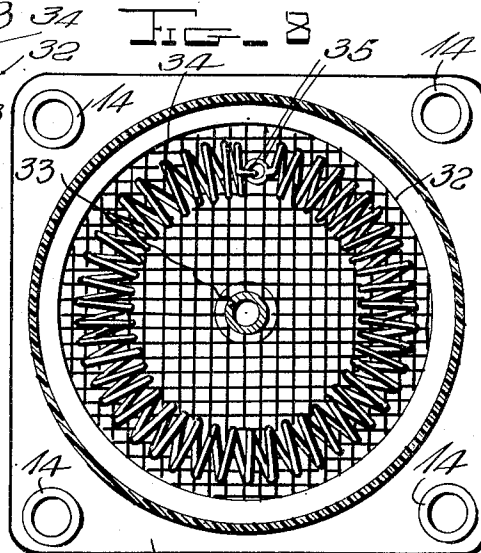
Jan. 22, 1957

K. W. JOHNSON
VIBRATION DAMPENER

2,778,629

Filed Sept. 1, 1954

2 Sheets-Sheet 2



INVENTOR
KENNETH W. JOHNSON,

BY *John V. Skim*

ATTORNEY

1

2,778,629

VIBRATION DAMPENER

Kenneth W. Johnson, Dayton, Ohio

Application September 1, 1954, Serial No. 453,644

6 Claims. (Cl. 267—1)

The present invention relates to a vibration dampener and it consists in the combinations, constructions and arrangements of parts herein described and claimed.

Generally, the present invention consists of an improvement over my previous application for a vibration isolator, Serial No. 389,710, filed November 2, 1953, and possesses in addition to the features of the former invention, certain novel features peculiar to itself. Essentially, the present device includes a base upon which is mounted a generally cylindrical housing having an opening in the top thereof and through which extends an anchoring member having mounted upon its lower end in novel manner, a pad of screening material. A ring of metal cloth for screening material is mounted upon the base and is provided with an annular groove in which the free edge portion of a concavo-convex load carrying element is positioned. This element presents its convex face upwardly and is attached to a similar element presenting its convex face downwardly by means of a centrally located rivet or the like. The upper element bears against the lower face of the pad carried by the anchoring device above referred to. A coil spring is interconnected at its ends to present a circular formation and is mounted between the two load carrying elements and is, of course, biased radially inwardly and acts to urge the two load carrying elements apart, thus forming an additional resistance to shocks imparted to the device through the anchoring element.

It is accordingly an object of the invention to provide an improved unit of the character set forth which is fully self contained and which provides a maximum shock resisting power for a minimum of occupied space.

Still another object of the invention is to provide an object of the character set forth which is capable of long life under varied climatic conditions.

A further object of the invention is to provide a device of the character set forth which is simple in construction, inexpensive to manufacture and yet effective and efficient in use.

A further object of the invention is to provide, in a device of the character set forth, a novel coil spring resistor element forming a part of the invention.

A still further object of the invention is to provide, in a device of the character set forth, novel pads of metal cloth or screening, which pads form parts of the invention.

Other and further objects of the invention will become apparent from a reading of the following specification taken in conjunction with the drawings, in which:

Figure 1 is a plan view of a supporting structure illustrating a plurality of units of the present invention in use therein.

Figure 2 is an elevational view of an embodiment of the invention.

Figure 3 is a plan view of the device shown in Figure 2.

Figure 4 is an enlarged fragmentary sectional view illustrating the manner of attaching the present device to a supporting structure.

2

Figure 5 is a sectional view taken along line 5—5 of Figure 3, showing the device in normal condition.

Figure 6 is a view similar to Figure 5 but showing the device as it appears when bearing a load.

Figure 7 is a sectional view taken along line 7—7 of Figure 5.

Figure 8 is a sectional view taken along line 8—8 of Figure 6.

Figure 9 is an elevational view of a pair of load carrying elements forming a part of the invention, and

Figure 10 is a plan view of Figure 9.

Referring more particularly to the drawings, there is shown therein a device of the character set forth comprising a substantially square base 10 having a centrally disposed circular raised portion 11. A generally cylindrical housing 12 is provided with an integrally formed outwardly extending flange 13 at its lower end, which flange is adapted to rest upon the base 10 and is of identical size therewith. Eyelets 14 extend through suitable openings in each corner of both the base 10 and the flange 13 to interconnect the same and screws 15 may be inserted through the eyelets 14 whereby to attach the devices of the present invention to a supporting structure such as a box 16 as illustrated in Figures 1 and 4.

The upper or outer end of the housing 12 is provided with an integrally formed top or cover 17 which is provided with a centrally disposed opening 18. Radially extending reinforcing ridges 19 may be provided in the top 17 if desired.

An anchoring element is generally indicated at 20 and consists of a hexagonal body 21 internally threaded in its outer portion for the reception of a bolt 22 whose other end is adapted to be affixed to a load such as is indicated, for example, in dotted lines at 23 in Figure 1. The lower or inner end of the body 21 is provided with an integrally formed rivet 24 for the attachment thereto of the centrally disposed upwardly raised portion 25 of a washer 26. The inner portion of the body 21 is reduced to provide a shoulder 27 and a pad 28, formed substantially of layers of metal cloth or a screening material which is formed by loosely interlocking small diameter wire into loops and compressing same substantially into layers, is interposed between the shoulder 27 and the upper face of the washer 26, the pad 28 being circular in form and extending beyond the outer periphery of the washer 26 to points adjacent to but not in contact with the inner face of the housing 12.

A ring 29 likewise formed of a metal cloth or screening material as described above is mounted upon the base 10 in contact with the inner wall of the housing or casing 12 and is provided with an inwardly extending flange 30.

An upper load carrying element 31 of concavo-convex shape has its free end portion in contact with the underside of the pad 28 immediately outwardly of the periphery of the washer 26 and presents its convex side downwardly. A lower load carrying element 32 of identical construction to the element 31 has its free edge portion mounted upon the flange 30 and presents its convex side upwardly. An eyelet 33 centrally interconnects the elements 31 and 32. Load carrying elements 31 and 32 may be formed of a yieldable metal material and in this embodiment of the invention are preferably formed of wire screen material, the individual wires of which extend at right angles to one another so that each individual wire constitutes in itself a spring.

An elongated coil spring 34 is provided at each of its ends with an open ended loop which loops may be interconnected to thus cause the spring 34 to assume a generally circular shape. The spring 34 is mounted between the convex faces of the elements 31 and 32 in a position generally concentric with the eyelet 33.

3

In operation, it will be apparent that the load carrying elements 31 and 32 together with spring element 34 will mutually collaborate to synergistically absorb shocks and vibrations transmitted thereto from a load as the load 23 shown in Figure 1, for example, through the bolt 22, it being understood that a plurality of the devices shown in the drawings may be utilized to support a single load, likewise as shown in Figure 1 of the drawings. When a shock is thus transmitted through the bolt 22, it will cause an inward movement of the body 21 through the opening 18, as shown in Figure 6. This acts to compress the elements 31 and 32 thus forcing outwardly the spring 34 from its position illustrated in Figures 5 and 7 to a position shown, for example, in Figures 6 and 8, it being apparent that the spring 34 is biased radially inwardly. Thus it will be seen that the spring 34 acts to absorb a portion of the shock or vibration transmitted to the device through the bolt 22 as aforesaid. It will also be apparent that shocks or vibrations transmitted to the device from other than a vertical angle will likewise be taken care of due to the flexibility, not only of the elements 31 and 32, but of the spring 34 which will yield to pressure between the elements 31 and 32 while at the same time exerting a counter-effect against such movement of the elements 31 and 32 toward each other. It will also be apparent that the pad 28 and ring 29, being composed of pluralities of layers of spring material, will likewise act to absorb vibration and minor shocks imparted to the device.

While but one form of the invention has been shown and described herein, it will be readily apparent to those skilled in the art that many minor modifications may be made without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. A device of the character described comprising a hollow cylindrical casing, a base affixed to one end of said casing, a top having a circular opening on the other end of said casing, an anchoring element extending outwardly through said opening, a washer affixed to the inner end of said anchoring element, a circular pad surrounding said anchoring element and mounted atop said washer within said casing, a ring of yieldable material mounted on said base and abutting the inner wall of said casing, an inwardly directed flange formed integrally with said ring, an upper concavo-convex yield-

4

able element having its peripheral edge bearing against the under side of said pad, a like lower yieldable element having its peripheral edge bearing against said flange, and a fastener centrally interconnecting said yieldable elements.

2. A device of the character described comprising a hollow cylindrical casing, a base affixed to one end of said casing, a top having a circular opening on the other end of said casing, an anchoring element extending outwardly through said opening, a washer affixed to the inner end of said anchoring element, a circular pad surrounding said anchoring element and mounted atop said washer within said casing, a ring of yieldable material mounted on said base and abutting the inner wall of said casing, an inwardly directed flange formed integrally with said ring, an upper concavo-convex yieldable element having its peripheral edge bearing against the under side of said pad, a like lower yieldable element having its peripheral edge bearing against said flange, a fastener centrally interconnecting said yieldable elements, and a circularly extending coil spring interconnected at its ends and bearing against the convex faces of said yieldable elements.

3. A device as defined in claim 1 wherein said pad and said ring are each composed substantially of layers of metal screening.

4. A device as defined in claim 2 wherein said pad and said ring are each composed substantially of layers of metal screening.

5. A device as defined in claim 1 wherein said washer is of greater diameter than said opening and wherein said pad is of greater diameter than said washer and of slightly less diameter than said casing.

6. A device as defined in claim 2 wherein said washer is of greater diameter than said opening and wherein said pad is of greater diameter than said washer and of slightly less diameter than said casing.

References Cited in the file of this patent

UNITED STATES PATENTS

1,506,557	Bird	Aug. 26, 1924
1,930,186	Swallow	Oct. 10, 1933
2,502,313	Dodge	Mar. 28, 1950
2,680,284	Markowski	June 8, 1954
2,687,269	Titus et al.	Aug. 24, 1954
2,688,479	Barbera	Sept. 7, 1954